

**CONTENTS**

COVER SHEET ..... iii

NOTATION ..... xxv

ENGLISH/METRIC AND METRIC/ENGLISH EQUIVALENTS ..... xxx

SUMMARY ..... S-1

S.1 INTRODUCTION ..... S-1

    S.1.1 Background Information..... S-1

        S.1.1.1 Creation of USEC..... S-5

        S.1.1.2 Growing Concern over the DUF<sub>6</sub> Inventory ..... S-6

        S.1.1.3 Programmatic NEPA Review and Congressional Interest ..... S-7

        S.1.1.4 DOE Request for Contractor Proposals and  
                Site-Specific NEPA Review..... S-8

        S.1.1.5 Public Law 107-206 Passed by Congress..... S-9

        S.1.1.6 Characteristics of DUF<sub>6</sub> ..... S-10

    S.1.2 Purpose and Need ..... S-11

    S.1.3 Proposed Action..... S-11

    S.1.4 Scope..... S-12

    S.1.5 Public Review of the Draft EIS ..... S-12

    S.1.6 Relationship to Other NEPA Reviews..... S-13

    S.1.7 Organization of This Environmental Impact Statement ..... S-14

S.2 Alternatives..... S-14

    S.2.1 No Action Alternative..... S-14

    S.2.2 Proposed Action Alternatives ..... S-16

        S.2.2.1 Alternative Location A (Preferred Alternative) ..... S-17

        S.2.2.2 Alternative Location B ..... S-19

        S.2.2.3 Alternative Location C ..... S-19

        S.2.2.4 Conversion Process Description..... S-19

        S.2.2.5 Preparation and Transportation of ETTP  
                Cylinders to Portsmouth..... S-22

        S.2.2.6 Construction of a New Cylinder Storage Yard  
                at Portsmouth..... S-24

        S.2.2.7 Option of Shipping ETTP Cylinders to Paducah ..... S-24

        S.2.2.8 Option of Expanding Conversion Facility Operations ..... S-26

    S.2.3 Alternatives Considered but Not Analyzed in Detail ..... S-27

        S.2.3.1 Use of Commercial Conversion Capacity ..... S-27

        S.2.3.2 Sites Other Than Portsmouth ..... S-27

        S.2.3.3 Alternative Conversion Processes ..... S-27

        S.2.3.4 Long-Term Storage and Disposal Alternatives ..... S-27

        S.2.3.5 Other Transportation Modes ..... S-28

        S.2.3.6 One Conversion Plant for Two Sites ..... S-28

**CONTENTS (Cont.)**

S.3	Affected Environment .....	S-28
S.4	Environmental Impact Assessment Approach, Assumptions, and Methodology .....	S-29
S.5	Consequences and Comparison of Alternatives .....	S-32
S.5.1	Human Health and Safety — Construction and Normal Facility Operations .....	S-32
S.5.2	Human Health and Safety — Facility Accidents .....	S-33
S.5.2.1	Physical Hazards.....	S-33
S.5.2.2	Facility Accidents Involving Radiation or Chemical Releases.....	S-33
S.5.3	Human Health and Safety — Transportation.....	S-37
S.5.4	Air Quality and Noise .....	S-41
S.5.5	Water and Soil.....	S-42
S.5.6	Socioeconomics.....	S-42
S.5.7	Ecology.....	S-43
S.5.8	Waste Management .....	S-43
S.5.9	Resource Requirements.....	S-44
S.5.10	Land Use .....	S-45
S.5.11	Cultural Resources .....	S-45
S.5.12	Environmental Justice .....	S-45
S.5.13	Impacts from Cylinder Preparation at ETTP.....	S-45
S.5.14	Impacts Associated with Conversion Product Sale and Use.....	S-46
S.5.15	Impacts from D&D Activities .....	S-47
S.5.16	Cumulative Impacts.....	S-47
S.5.17	Mitigation.....	S-49
S.5.18	Unavoidable Adverse Impacts .....	S-51
S.5.19	Irreversible and Irrecoverable Commitment of Resources .....	S-51
S.5.20	Relationship between Short-Term Use of the Environment and Long-Term Productivity.....	S-51
S.5.21	Pollution Prevention and Waste Minimization .....	S-52
S.5.22	Potential Impacts Associated with the Option of Expanding Conversion Facility Operations.....	S-52
S.6	Environmental and Occupational Safety and Health Permits and Compliance Requirements .....	S-53
S.7	Preferred Alternative .....	S-54
1	INTRODUCTION .....	1-1
1.1	Background Information.....	1-2
1.1.1	Creation of USEC.....	1-3
1.1.2	Growing Concern over the DUF <sub>6</sub> Inventory .....	1-4
1.1.3	Programmatic NEPA Review and Congressional Interest .....	1-6

**CONTENTS (Cont.)**

1.1.4	DOE Request for Contractor Proposals and Site-Specific NEPA Review.....	1-7
1.1.5	Public Law 107-206 Passed by Congress.....	1-8
1.2	Characteristics of DUF <sub>6</sub> .....	1-9
1.2.1	Cylinder Inventory.....	1-10
1.2.2	Cylinder Condition and Potential Contamination .....	1-12
1.3	Purpose and Need.....	1-13
1.4	Proposed Action.....	1-13
1.5	DOE DUF <sub>6</sub> Management Program.....	1-14
1.6	Scope.....	1-15
1.6.1	Public Scoping Process for This Environmental Impact Statement .....	1-16
1.6.2	Scope of This Environmental Impact Statement .....	1-18
1.6.2.1	Alternatives .....	1-18
1.6.2.2	Depleted Uranium Conversion Technologies and Products.....	1-19
1.6.2.3	Transportation Modes.....	1-19
1.6.2.4	Conversion Product Disposition.....	1-20
1.6.2.5	Human Health and Environmental Issues .....	1-21
1.6.3	Public Review of the Draft EIS .....	1-22
1.7	Relationship to Other NEPA Reviews.....	1-25
1.8	Other Documents and Studies Related to DUF <sub>6</sub> Management and Conversion Activities .....	1-29
1.9	Organization of This Environmental Impact Statement .....	1-32
2	DESCRIPTION AND COMPARISON OF ALTERNATIVES .....	2-1
2.1	No Action Alternative.....	2-1
2.2	Proposed Action.....	2-4
2.2.1	Action Alternatives .....	2-6
2.2.1.1	Alternative Location A (Preferred Alternative).....	2-6
2.2.1.2	Alternative Location B .....	2-8
2.2.1.3	Alternative Location C .....	2-8
2.2.2	Conversion Process Description.....	2-8
2.2.2.1	Cylinder Transfer System.....	2-9
2.2.2.2	Vaporization System.....	2-13
2.2.2.3	Conversion System.....	2-13
2.2.2.4	Depleted Uranium Conversion Product Handling System .....	2-14
2.2.2.5	HF Recovery System .....	2-14
2.2.2.6	Emptied Cylinder Processing .....	2-15
2.2.2.7	Management of Potential Transuranic and PCB Contamination .....	2-15
2.2.3	Conversion Product Disposition .....	2-17
2.2.4	Preparation and Transportation of ETTP Cylinders.....	2-19
2.2.5	Construction of a New Cylinder Storage Yard at Portsmouth.....	2-21
2.2.6	Option of Shipping ETTP Cylinders to Paducah .....	2-23

**CONTENTS (Cont.)**

2.2.7	Option of Expanding Conversion Facility Operations .....	2-23
2.3	Alternatives Considered but Not Analyzed in Detail .....	2-25
2.3.1	Utilization of Commercial Conversion Capacity .....	2-25
2.3.2	Other Sites .....	2-26
2.3.3	Other Conversion Technologies .....	2-26
2.3.4	Long-Term Storage and Disposal Alternatives .....	2-27
2.3.5	Other Transportation Modes .....	2-27
2.3.6	One Conversion Plant Alternative .....	2-28
2.4	Comparison of Alternatives .....	2-28
2.4.1	General .....	2-28
2.4.2	Summary and Comparison of Potential Environmental Impacts .....	2-29
2.4.2.1	Human Health and Safety — Construction and Normal Facility Operations .....	2-30
2.4.2.2	Human Health and Safety — Facility Accidents .....	2-31
2.4.2.3	Human Health and Safety — Transportation .....	2-35
2.4.2.4	Air Quality and Noise .....	2-38
2.4.2.5	Water and Soil .....	2-39
2.4.2.6	Socioeconomics .....	2-39
2.4.2.7	Ecology .....	2-40
2.4.2.8	Waste Management .....	2-41
2.4.2.9	Resource Requirements .....	2-42
2.4.2.10	Land Use .....	2-42
2.4.2.11	Cultural Resources .....	2-42
2.4.2.12	Environmental Justice .....	2-42
2.4.2.13	Impacts from Cylinder Preparation at ETTP .....	2-43
2.4.2.14	Impacts Associated with Conversion Product Sale and Use .....	2-43
2.4.2.15	Impacts from D&D Activities .....	2-44
2.4.2.16	Cumulative Impacts .....	2-44
2.4.2.17	Potential Impacts Associated with the Option of Expanding Conversion Facility Operations .....	2-46
2.5	Preferred Alternative .....	2-48
3	AFFECTED ENVIRONMENT .....	3-1
3.1	Portsmouth Site .....	3-1
3.1.1	Cylinder Yards .....	3-3
3.1.2	Site Infrastructure .....	3-3
3.1.3	Climate, Air Quality, and Noise .....	3-5
3.1.3.1	Climate .....	3-5
3.1.3.2	Existing Air Emissions .....	3-5
3.1.3.3	Air Quality .....	3-7
3.1.3.4	Existing Noise Environment .....	3-8

**CONTENTS (Cont.)**

3.1.4	Geology and Soil.....	3-11
3.1.4.1	Topography, Structure, and Seismic Risk.....	3-11
3.1.4.2	Soils.....	3-12
3.1.5	Water Resources.....	3-13
3.1.5.1	Surface Water.....	3-13
3.1.5.2	Groundwater.....	3-16
3.1.6	Biotic Resources.....	3-17
3.1.6.1	Vegetation.....	3-17
3.1.6.2	Wildlife.....	3-18
3.1.6.3	Wetlands.....	3-19
3.1.6.4	Threatened and Endangered Species.....	3-21
3.1.7	Public and Occupational Safety and Health.....	3-22
3.1.7.1	Radiation Environment.....	3-22
3.1.7.2	Chemical Environment.....	3-22
3.1.8	Socioeconomics.....	3-25
3.1.8.1	Population.....	3-25
3.1.8.2	Employment.....	3-25
3.1.8.3	Personal Income.....	3-27
3.1.8.4	Housing.....	3-30
3.1.8.5	Community Resources.....	3-31
3.1.9	Waste Management.....	3-31
3.1.9.1	Wastewater.....	3-33
3.1.9.2	Solid Nonhazardous, Nonradioactive Waste.....	3-34
3.1.9.3	Nonradioactive Hazardous and Toxic Waste.....	3-34
3.1.9.4	Low-Level Radioactive Waste.....	3-34
3.1.9.5	Low-Level Radioactive Mixed Waste.....	3-34
3.1.10	Land Use.....	3-34
3.1.11	Cultural Resources.....	3-36
3.1.12	Environmental Justice.....	3-37
3.1.12.1	Minority Populations.....	3-37
3.1.12.2	Low-Income Populations.....	3-37
3.2	East Tennessee Technology Park.....	3-39
3.2.1	Cylinder Yards.....	3-39
3.2.2	Site Infrastructure.....	3-42
3.2.3	Climate, Air Quality, and Noise.....	3-43
3.2.3.1	Climate.....	3-43
3.2.3.2	Existing Air Emissions.....	3-43
3.2.3.3	Air Quality.....	3-46
3.2.3.4	Existing Noise Environment.....	3-46
3.2.4	Geology and Soil.....	3-50
3.2.4.1	Topography, Structure, and Seismic Risk.....	3-50
3.2.4.2	Soils.....	3-51
3.2.5	Water Resources.....	3-52

**CONTENTS (Cont.)**

3.2.5.1	Surface Water .....	3-52
3.2.5.2	Groundwater .....	3-54
3.2.6	Biotic Resources.....	3-56
3.2.6.1	Vegetation.....	3-56
3.2.6.2	Wildlife.....	3-56
3.2.6.3	Wetlands .....	3-56
3.2.6.4	Threatened and Endangered Species .....	3-57
3.2.7	Public and Occupational Safety and Health.....	3-57
3.2.7.1	Radiation Environment.....	3-57
3.2.7.2	Chemical Environment.....	3-57
3.2.8	Socioeconomics.....	3-61
3.2.8.1	Population.....	3-61
3.2.8.2	Employment .....	3-62
3.2.8.3	Personal Income .....	3-64
3.2.8.4	Housing.....	3-65
3.2.8.5	Community Resources.....	3-66
3.2.9	Waste Management .....	3-68
3.2.9.1	Wastewater .....	3-69
3.2.9.2	Solid Nonhazardous, Nonradioactive Waste.....	3-69
3.2.9.3	Nonradioactive Hazardous and Toxic Waste .....	3-69
3.2.9.4	Low-Level Radioactive Waste .....	3-69
3.2.9.5	Low-Level Radioactive Mixed Waste.....	3-70
3.2.10	Land Use .....	3-70
3.2.11	Cultural Resources .....	3-72
3.2.12	Environmental Justice .....	3-73
3.2.12.1	Minority Populations .....	3-73
3.2.12.2	Low-Income Populations.....	3-73
4	<b>ENVIRONMENTAL IMPACT ASSESSMENT APPROACH, ASSUMPTIONS, AND METHODOLOGY.....</b>	<b>4-1</b>
4.1	General Approach.....	4-1
4.2	Major Assumptions and Parameters .....	4-2
4.3	Methodology.....	4-2
4.3.1	Overview of the Human Health Assessment.....	4-5
4.3.2	Radiation .....	4-5
4.3.2.1	Background Radiation .....	4-5
4.3.2.2	Radiation Doses and Health Effects .....	4-7
4.3.3	Chemicals.....	4-9
4.3.4	Accidents.....	4-10
4.3.4.1	Accident Consequences.....	4-10
4.3.4.2	Accident Frequencies .....	4-12
4.3.4.3	Accident Risk .....	4-12

**CONTENTS (Cont.)**

4.3.4.4	Physical Hazard Accidents .....	4-13
4.4	Uncertainty in Estimated Impacts.....	4-13
5	ENVIRONMENTAL IMPACTS OF ALTERNATIVES .....	5-1
5.1	No Action Alternative.....	5-1
5.1.1	Introduction.....	5-1
5.1.1.1	Cylinder Maintenance Activities.....	5-2
5.1.1.2	Assumptions and Methods Used to Assess Impacts Associated with Cylinder Breaches.....	5-4
5.1.2	Impacts of No Action at the Portsmouth Site .....	5-6
5.1.2.1	Human Health and Safety.....	5-6
5.1.2.2	Transportation .....	5-14
5.1.2.3	Air Quality and Noise.....	5-14
5.1.2.4	Water and Soil.....	5-15
5.1.2.5	Socioeconomics.....	5-17
5.1.2.6	Ecology.....	5-17
5.1.2.7	Waste Management.....	5-18
5.1.2.8	Resource Requirements.....	5-18
5.1.2.9	Land Use.....	5-18
5.1.2.10	Cultural Resources .....	5-18
5.1.2.11	Environmental Justice .....	5-19
5.1.3	ETTP Site .....	5-19
5.1.3.1	Human Health and Safety.....	5-19
5.1.3.2	Transportation .....	5-27
5.1.3.3	Air Quality and Noise.....	5-27
5.1.3.4	Water and Soil.....	5-28
5.1.3.5	Socioeconomics.....	5-30
5.1.3.6	Ecology.....	5-30
5.1.3.7	Waste Management.....	5-31
5.1.3.8	Resource Requirements.....	5-31
5.1.3.9	Land Use.....	5-31
5.1.3.10	Cultural Resources .....	5-31
5.1.3.11	Environmental Justice .....	5-32
5.2	Proposed Action Alternatives .....	5-32
5.2.1	Portsmouth Site — Cylinder Storage Yard Construction Impacts.....	5-33
5.2.1.1	Human Health and Safety — Normal Construction Activities.....	5-33
5.2.1.2	Human Health and Safety — Accidents.....	5-34
5.2.1.3	Air Quality and Noise.....	5-34
5.2.1.4	Water and Soil.....	5-37
5.2.1.5	Socioeconomics.....	5-39
5.2.1.6	Ecology.....	5-39

**CONTENTS (Cont.)**

5.2.1.7	Waste Management .....	5-40
5.2.1.8	Resource Requirements .....	5-40
5.2.1.9	Land Use.....	5-40
5.2.1.10	Cultural Resources .....	5-41
5.2.1.11	Environmental Justice .....	5-41
5.2.2	Portsmouth Site — Conversion Facility Construction Impacts.....	5-42
5.2.2.1	Human Health and Safety — Normal Construction Activities.....	5-42
5.2.2.2	Human Health and Safety — Accidents.....	5-43
5.2.2.3	Air Quality and Noise.....	5-43
5.2.2.4	Water and Soil .....	5-48
5.2.2.5	Socioeconomics.....	5-49
5.2.2.6	Ecology.....	5-50
5.2.2.7	Waste Management .....	5-56
5.2.2.8	Resource Requirements.....	5-56
5.2.2.9	Land Use.....	5-57
5.2.2.10	Cultural Resources .....	5-58
5.2.2.11	Environmental Justice .....	5-59
5.2.3	Portsmouth Site — Operational Impacts .....	5-59
5.2.3.1	Human Health and Safety — Normal Facility Operations.....	5-59
5.2.3.2	Human Health and Safety — Facility Accidents .....	5-64
5.2.3.3	Air Quality and Noise.....	5-76
5.2.3.4	Water and Soil .....	5-82
5.2.3.5	Socioeconomics.....	5-84
5.2.3.6	Ecology.....	5-85
5.2.3.7	Waste Management .....	5-86
5.2.3.8	Resource Requirements.....	5-88
5.2.3.9	Land Use.....	5-88
5.2.3.10	Cultural Resources .....	5-89
5.2.3.11	Environmental Justice .....	5-90
5.2.4	Cylinder Preparation Impacts at ETTP.....	5-90
5.2.4.1	Cylinder Overpack Option .....	5-91
5.2.4.2	Cylinder Transfer Facility Option .....	5-92
5.2.5	Transportation.....	5-93
5.2.5.1	Collective Population Risk.....	5-94
5.2.5.2	Maximally Exposed Individuals during Routine Conditions.....	5-101
5.2.5.3	Accident Consequence Assessment .....	5-102
5.2.5.4	Historical Safety Record of Anhydrous NH <sub>3</sub> and HF Transportation in the United States.....	5-110
5.2.6	Impacts Associated with HF and CaF <sub>2</sub> Conversion Product Sale and Use .....	5-111

**CONTENTS (Cont.)**

5.2.7 Impacts If ETTP Cylinders Are Shipped to Paducah Rather Than to Portsmouth ..... 5-112

5.2.8 Potential Impacts Associated with the Option of Expanding Conversion Facility Operations ..... 5-113

    5.2.8.1 Potential Impacts Associated with Increasing Plant Throughput..... 5-113

    5.2.8.2 Potential Impacts Associated with Extending the Plant Operational Period ..... 5-120

    5.2.8.3 Potential Impacts Associated with Possible Future Paducah-to-Portsmouth Cylinder Shipments ..... 5-120

5.3 Cumulative Impacts ..... 5-121

    5.3.1 Issues and Assumptions..... 5-121

    5.3.2 Portsmouth Site..... 5-125

        5.3.2.1 Radiological Releases — Normal Operations..... 5-126

        5.3.2.2 Accidental Releases — Radiological and Chemical Materials..... 5-126

        5.3.2.3 Transportation ..... 5-127

        5.3.2.4 Chemical Exposure — Normal Operations..... 5-127

        5.3.2.5 Air Quality..... 5-127

        5.3.2.6 Noise..... 5-127

        5.3.2.7 Water and Soil..... 5-128

        5.3.2.8 Ecology..... 5-128

        5.3.2.9 Land Use..... 5-129

        5.3.2.10 Cultural Resources ..... 5-129

        5.3.2.11 Environmental Justice ..... 5-129

        5.3.2.12 Socioeconomics ..... 5-129

    5.3.3 ETTP Site ..... 5-129

5.4 Mitigation ..... 5-130

5.5 Unavoidable Adverse Impacts..... 5-133

5.6 Irreversible and Irretrievable Commitment of Resources ..... 5-134

    5.6.1 Land..... 5-134

    5.6.2 Materials ..... 5-134

    5.6.3 Energy..... 5-135

5.7 Relationship between Short-Term Use of the Environment and Long-Term Productivity ..... 5-136

5.8 Pollution Prevention and Waste Minimization..... 5-136

5.9 Decontamination and Decommissioning of the Conversion Facility..... 5-138

    5.9.1 Human Health and Safety — Off-Site Public..... 5-138

    5.9.2 Human Health and Safety — On-Site Workforce ..... 5-139

    5.9.3 Air Quality..... 5-140

    5.9.4 Socioeconomics ..... 5-141

    5.9.5 Waste Management ..... 5-141

**CONTENTS (Cont.)**

6	ENVIRONMENTAL AND OCCUPATIONAL SAFETY AND HEALTH PERMITS AND COMPLIANCE REQUIREMENTS .....	6-1
6.1	DUF <sub>6</sub> Cylinder Management and Construction and Operation of a DUF <sub>6</sub> Conversion Facility .....	6-1
6.2	Transportation of UF <sub>6</sub> .....	6-1
6.3	Worker Safety and Health .....	6-3
7	REFERENCES .....	7-1
8	LIST OF PREPARERS .....	8-1
9	GLOSSARY .....	9-1
10	INDEX.....	10-1
	APPENDIX A: Text of Public Law 107-206 Pertinent to the Management of DUF <sub>6</sub> .....	A-1
	APPENDIX B: Issues Associated with DUF <sub>6</sub> Cylinder Contamination .....	B-1
	APPENDIX C: Scoping Summary Report for Depleted Uranium Hexafluoride Conversion Facilities Environmental Impact Statement Scoping Process .....	C-1
	APPENDIX D: Environmental Synopsis for the Depleted UF <sub>6</sub> Conversion Project .....	D-1
	APPENDIX E: Impacts Associated with HF and CaF <sub>2</sub> Conversion Product Sale and Use .....	E-1
	APPENDIX F: Assessment Methodologies .....	F-1
	APPENDIX G: Consultation Letters.....	G-1
	APPENDIX H: Contractor Disclosure Statement.....	H-1

**FIGURES**

S-1	Regional Map of the Portsmouth, Ohio, Site Vicinity.....	S-2
S-2	Storage of DUF <sub>6</sub> Cylinders.....	S-4

**FIGURES (Cont.)**

S-3	Three Alternative Conversion Facility Locations within the Portsmouth Site, with Location A Being the Preferred Alternative .....	S-18
S-4	Conceptual Overall Material Flow Diagram for the Portsmouth Conversion Facility .....	S-20
S-5	Conceptual Conversion Facility Site Layout for Portsmouth .....	S-21
S-6	Potential Locations for Construction of a New Cylinder Storage Yard at Portsmouth .....	S-25
S-7	Areas of Potential Impact Evaluated for Each Alternative .....	S-30
1-1	DUF <sub>6</sub> Storage Locations .....	1-2
1.1-1	Storage of DUF <sub>6</sub> Cylinders. ....	1-4
2.2-1	Three Alternative Conversion Facility Locations within the Portsmouth Site, with Location A Being the Preferred Alternative .....	2-7
2.2-2	Conceptual Overall Material Flow Diagram for the Portsmouth Conversion Facility.....	2-10
2.2-3	Conceptual Conversion Facility Site Layout for Portsmouth .....	2-11
2.2-4	Potential Locations for Construction of a New Cylinder Storage Yard at Portsmouth .....	2-22
3.1-1	Regional Map of the Portsmouth Site Vicinity .....	3-2
3.1-2	Locations of Cylinder Yards at the Portsmouth Site That Are Used to Store DOE-Managed Cylinders .....	3-4
3.1-3	Wind Rose for the Portsmouth Site, 1995–2001.....	3-6
3.1-4	Portsmouth Site Drainage Features.....	3-15
3.1-5	Wetlands in the Vicinity of the Three Candidate Locations for the Portsmouth Conversion Facility.....	3-20
3.1-6	Land Cover in Pike County, Ohio.....	3-35

**FIGURES (Cont.)**

3.1-7	Census Tracts within 50 mi of the Conversion Facility at the Portsmouth Site with Minority Populations in Excess of State-Specific Thresholds.....	3-38
3.1-8	Census Tracts within 50 mi of the Conversion Facility at the Portsmouth Site with Low-Income Populations in Excess of State-Specific Thresholds.....	3-40
3.2-1	Regional Map of the ETTP Vicinity .....	3-41
3.2-2	Locations of Storage Yards at ETTP That Are Used to Store DOE-Managed Cylinders .....	3-42
3.2-3	Wind Rose for the ETTP K1209 Meteorological Tower .....	3-44
3.2-4	Surface Water Features in the Vicinity of ETTP .....	3-53
3.2-5	Land Cover in Roane County, Tennessee .....	3-71
3.2-6	Census Tracts within 50 mi of the Storage Facility at ETTP with Minority Populations in Excess of State-Specific Thresholds.....	3-74
3.2-7	Census Tracts within 50 mi of the Storage Facility at ETTP with Low-Income Populations in Excess of State-Specific Thresholds.....	3-76
4.3-1	Areas of Potential Impact Evaluated for Each Alternative .....	4-4
5.2-1	Wetlands within Location A at the Portsmouth Site .....	5-54

**TABLES**

S-1	Inventory of DOE UF <sub>6</sub> Cylinders Considered in This EIS.....	S-4
S-2	Summary of Alternatives Considered for the Portsmouth Conversion Facility EIS .....	S-15
S-3	Summary of Portsmouth Conversion Facility Parameters.....	S-22
S-4	Summary of Proposed Conversion Product Treatment and Disposition .....	S-23
S-5	Summary of Major EIS Data and Assumptions.....	S-31

**TABLES (Cont.)**

S-6	Summary Comparison of Potential Environmental Consequences of the Alternatives .....	S-55
1.1-1	Inventory of DOE UF <sub>6</sub> Cylinders Considered in This EIS .....	1-11
2.1-1	Summary of Alternatives Considered .....	2-2
2.2-1	Summary of Portsmouth Conversion Facility Parameters .....	2-12
2.2-2	Summary of Proposed Conversion Product Treatment and Disposition.....	2-18
2.4-1	Summary Comparison of Potential Environmental Consequences of the Alternatives .....	2-49
3.1-1	DOE-Managed DUF <sub>6</sub> Cylinders at the Portsmouth Site.....	3-3
3.1-2	Annual Criteria Pollutant and Volatile Organic Compound Emissions from USEC and DOE Sources at the Portsmouth Site in 2001.....	3-7
3.1-3	National Ambient Air Quality Standards, Ohio State Ambient Air Quality Standards, Maximum Allowable Increments for Prevention of Significant Deterioration, and Highest Background Levels Representative of the Portsmouth Gaseous Diffusion Plant .....	3-9
3.1-4	Federal- and State-Listed Endangered, Potentially Threatened, and Special Concern Species near the Portsmouth Site.....	3-21
3.1-5	Estimated Radiation Doses to Members of the General Public and Cylinder Yard Workers at the Portsmouth Gaseous Diffusion Plant.....	3-23
3.1-6	Estimated Hazard Quotients for Members of the General Public near the Portsmouth Site under Existing Environmental Conditions.....	3-24
3.1-7	Population in the Portsmouth Region of Influence and Ohio in 1990, 2000, and 2003 .....	3-26
3.1-8	Employment in Scioto County by Industry in 1990 and 2000.....	3-26
3.1-9	Employment in Pike County by Industry in 1990 and 2000.....	3-27
3.1-10	Employment in the Portsmouth Region of Influence by Industry in 1990 and 2000.....	3-28

**TABLES (Cont.)**

3.1-11 Unemployment Rates in Scioto and Pike Counties, the Portsmouth Region of Influence, and Ohio ..... 3-29

3.1-12 Personal Income in Scioto and Pike Counties and the Portsmouth Region of Influence in 1990, 2000, and 2003 ..... 3-29

3.1-13 Housing Characteristics in the City of Portsmouth, Scioto and Pike Counties, and the Region of Influence in 1990 and 2000 ..... 3-30

3.1-14 Public Service Employment in the City of Portsmouth, Scioto and Pike Counties, and Ohio in 2002..... 3-31

3.1-15 Number of Physicians in Scioto and Pike Counties and Ohio in 1997 ..... 3-32

3.1-16 School District Data for Scioto and Pike Counties and Ohio in 2001 ..... 3-32

3.1-17 Medical Facility Data for Scioto and Pike Counties in 1998 ..... 3-32

3.1-18 Projected Waste Generation Volumes for the Portsmouth Site ..... 3-33

3.2-1 DOE-Managed DUF<sub>6</sub> Cylinders at the ETTP Site..... 3-39

3.2-2 Annual Criteria Pollutant and Volatile Organic Compound Emissions from Selected Major Point Sources around the ETTP Site in 1999..... 3-45

3.2-3 National Ambient Air Quality Standards, Tennessee State Ambient Air Quality Standards, Maximum Allowable Increments for Prevention of Significant Deterioration, and Highest Background Levels Representative of the ETTP Site ..... 3-47

3.2-4 Additional Tennessee Ambient Air Quality Standards ..... 3-49

3.2-5 Allowable Noise Level by Zoning District in Anderson County, Tennessee ..... 3-49

3.2-6 Federal- and State-Listed Endangered, Threatened, and Special Concern Species on ORR ..... 3-58

3.2-7 Estimated Radiation Doses to Members of the General Public and Cylinder Yard Workers at ETTP ..... 3-59

3.2-8 Estimated Hazard Quotients for Members of the Public near ETTP under Existing Environmental Conditions ..... 3-60

**TABLES (Cont.)**

3.2-9	Population in the ETTP Region of Influence and Tennessee in 1990, 2000, and 2003 .....	3-61
3.2-10	Employment in Knox County by Industry in 1990 and 2000 .....	3-62
3.2-11	Employment in Anderson County by Industry in 1990 and 2000.....	3-63
3.2-12	Employment in the ETTP Region of Influence by Industry in 1990 and 2000 .....	3-64
3.2-13	Unemployment Rate in the Knoxville Metropolitan Statistical Area and Tennessee.....	3-64
3.2-14	Personal Income in Knox and Anderson Counties and ETTP Region of Influence in 1990, 2000, and 2003 .....	3-65
3.2-15	Housing Characteristics in the City of Knoxville, Knox and Anderson Counties, and ETTP Region of Influence in 1990 and 2000.....	3-66
3.2-16	Public Service Employment in the City of Knoxville, Region-of-Influence Counties, and Tennessee in 2001 .....	3-67
3.2-17	Number of Physicians in Knox and Anderson Counties and Tennessee in 1997.....	3-67
3.2-18	School District Data for Knox and Anderson Counties and Tennessee in 2001.....	3-68
3.2-19	Medical Facility Data for Knox and Anderson Counties in 1998.....	3-68
3.2-20	Projected Waste Generation Volumes for ETTP .....	3-69
4.2-1	Summary of Major EIS Data and Assumptions .....	4-3
4.3-1	Key Features of Potential Human Exposures to Radiological, Chemical, and Physical Hazards .....	4-6
4.3-2	Comparison of Radiation Doses from Various Sources.....	4-8
5.1-1	No Action Alternative: Comparison of Frequencies Assumed in the PEIS with Planned Frequencies for Activities at the Portsmouth and ETTP Sites .....	5-3
5.1-2	No Action Alternative: Estimated Consequences of Chemical Exposures for Cylinder Accidents at the Portsmouth Site.....	5-11

**TABLES (Cont.)**

5.1-3	No Action Alternative: Estimated Consequences from Radiation Exposures for Cylinder Accidents at the Portsmouth Site.....	5-13
5.1-4	No Action Alternative: Estimated Consequences of Chemical Exposures from Cylinder Accidents at the ETTP Site.....	5-24
5.1-5	No Action Alternative: Estimated Consequences from Radiation Exposures for Cylinder Accidents at the ETTP Site.....	5-26
5.2-1	Potential Impacts to Human Health from Physical Hazards during Construction of an Additional Cylinder Storage Yard at the Portsmouth Site .....	5-34
5.2-2	Maximum Air Quality Impacts at the Construction Site Boundary Due to Emissions from Activities Associated with Construction of a New Cylinder Storage Yard at the Portsmouth Site.....	5-35
5.2-3	Materials/Resources Consumed during Construction of a Cylinder Storage Yard at the Portsmouth Site .....	5-40
5.2-4	Potential Impacts to Human Health from Physical Hazards during Conversion Facility Construction and Operations at the Portsmouth Site.....	5-44
5.2-5	Annual Criteria Pollutant and Volatile Organic Compound Emissions from Construction of the Conversion Facility at the Portsmouth Site.....	5-45
5.2-6	Maximum Air Quality Impacts at the Construction Site Boundary Due to Emissions from Activities Associated with Construction of the Conversion Facility at the Portsmouth Site .....	5-46
5.2-7	Socioeconomic Impacts from Construction of the Conversion Facility at the Portsmouth Site .....	5-50
5.2.8	Wastes Generated from Construction Activities for the Conversion Facility at the Portsmouth Site .....	5-56
5.2-9	Materials/Resources Consumed during Construction of the Conversion Facility at the Portsmouth Site.....	5-57
5.2-10	Estimated Radiological Doses and Cancer Risks under Normal Conversion Facility Operations at the Portsmouth Site.....	5-62
5.2-11	Bounding Radiological Accidents Considered for Conversion Operations at the Portsmouth Site.....	5-65

**TABLES (Cont.)**

5.2-12	Estimated Radiological Doses per Accident Occurrence during Conversion at the Portsmouth Site .....	5-66
5.2-13	Estimated Radiological Health Risks per Accident Occurrence during Conversion at the Portsmouth Site .....	5-67
5.2-14	Bounding Chemical Accidents during Conversion Operations at the Portsmouth Site .....	5-71
5.2-15	Consequences of Chemical Accidents during Conversion at the Portsmouth Site: Number of Persons with the Potential for Adverse Effects .....	5-72
5.2-16	Consequences of Chemical Accidents during Conversion at the Portsmouth Site: Number of Persons with the Potential for Irreversible Adverse Effects .....	5-73
5.2-17	Annual Point Source Emissions of Criteria Pollutants, Volatile Organic Compounds, Uranium, and Fluoride from Operation of the Conversion Facility at the Portsmouth Site.....	5-77
5.2-18	Maximum Air Quality Impacts Due to Emissions from Activities Associated with Operation of the Conversion Facility at the Portsmouth Site .....	5-78
5.2-19	Socioeconomic Impacts from Operation of the Conversion Facility at the Portsmouth Site .....	5-84
5.2-20	Wastes Generated from Operation of the Conversion Facility at the Portsmouth Site .....	5-87
5.2-21	Materials Consumed Annually during Normal Conversion Facility Operations at the Portsmouth Site.....	5-88
5.2-22	Utilities Consumed during Conversion Facility Operations at the Portsmouth Site .....	5-89
5.2-23	Summary of Environmental Parameters for a Cylinder Transfer Facility at ETPP .....	5-92
5.2-24	ETPP UF <sub>6</sub> Cylinder Shipments to Portsmouth .....	5-95

**TABLES (Cont.)**

5.2-25 Collective Population Transportation Risks for Shipment of Anhydrous NH<sub>3</sub> to the Portsmouth Conversion Facility..... 5-96

5.2-26 Collective Population Transportation Risks for Shipment of Conversion Products to Envirocare as the Primary Disposal Site, Assuming the U<sub>3</sub>O<sub>8</sub> Is Disposed of in Bulk Bags..... 5-98

5.2-27 Collective Population Transportation Risks for Shipment of Conversion Products to NTS as an Optional Disposal Site, Assuming the U<sub>3</sub>O<sub>8</sub> Is Disposed of in Bulk Bags..... 5-99

5.2-28 Collective Population Transportation Risks for Shipment of U<sub>3</sub>O<sub>8</sub> Conversion Products in Emptied Cylinders ..... 5-100

5.2-29 Collective Population Transportation Risks for Shipment of the HF Conversion Co-Product from the Portsmouth Site to Commercial Users..... 5-101

5.2-30 Collective Population Transportation Risks for Shipment of CaF<sub>2</sub> for the Neutralization Option ..... 5-102

5.2-31 Estimated Radiological Impacts to the MEI from Routine Shipment of Radioactive Materials from the Portsmouth Conversion Facility..... 5-103

5.2-32 Potential Radiological Consequences to the Population from Severe Transportation Accidents ..... 5-105

5.2-33 Potential Chemical Consequences to the Population from Severe Transportation Accidents ..... 5-106

5.2-34 Potential Radiological Consequences to the MEI from Severe Transportation Accidents Involving Shipment of Radioactive Materials..... 5-109

5.2-35 Products from DUF<sub>6</sub> Conversion..... 5-111

5.2-36 Annual Transportation Impacts for the Shipment of DUF<sub>6</sub> Cylinders from Paducah to Portsmouth, Assuming 1,000 DUF<sub>6</sub> Cylinders Shipped per Year..... 5-121

5.3-1 Cumulative Impacts of DUF<sub>6</sub> Activities and Other Past, Present, or Reasonably Foreseeable Future Actions at the Portsmouth Site ..... 5-122

5.6-1 Materials/Resources Consumed during Conversion Facility Construction at the Portsmouth Site ..... 5-135

**TABLES (Cont.)**

5.6-2	Materials Consumed Annually during Conversion Facility Operations at the Portsmouth Site .....	5-136
5.6-3	Utilities Consumed during Conversion Facility Operations at the Portsmouth Site .....	5-137
5.9-1	Estimated Latent Cancer Fatalities from Radiation Exposure Resulting from Conversion Facility D&D Activities at the Portsmouth Site .....	5-140
5.9-2	Annual and Total Waste Volume Estimates from Conversion Facility D&D Activities at the Portsmouth Site.....	5-142
6.1	Potentially Applicable Consents for the Construction and Operation of a DUF <sub>6</sub> Conversion Facility .....	6-4
B-1	Bounding Concentrations of Dispersed Transuranic and Tc-99 Contamination in the DUF <sub>6</sub> Full and Heels Cylinders .....	B-5
B-2	Maximum Total Quantities of Transuranics and Technetium in the DUF <sub>6</sub> Inventory.....	B-6
B-3	Concentrations of Transuranic Constituents and Tc-99 in Depleted Uranium That Would Result in 10% Contribution to Dose.....	B-8
B-4	Radiological Parameters for Uranium, Transuranic, and Technetium Isotopes.....	B-10
B-5	Relative Contributions of Transuranic and Technetium Isotopes to Dose.....	B-10
B-6	Estimated Maximum Transuranic Radioactivity Concentration in Heels.....	B-13
B-7	Estimated Maximum Transuranic Activity Concentration in Converted Heels Material .....	B-13
B-8	Estimated Maximum Number of Drums Containing Potential Transuranic Waste.....	B-13
E-1	Products from DUF <sub>6</sub> Conversion Assuming HF Acid Is Sold.....	E-4
E-2	Aqueous HF Levels for Sale .....	E-4
E-3	Activity Levels for Aqueous HF .....	E-5

**TABLES (Cont.)**

E-4	Activity Levels for CaF <sub>2</sub> .....	E-5
E-5	Process Control Specifications for HF .....	E-6
E-6	Process Control Specifications for Acid-Grade CaF <sub>2</sub> .....	E-6
F-1	Bounding Aqueous HF Spill Source Term .....	F-15
F-2	Anhydrous NH <sub>3</sub> Tank Rupture Spill Parameters .....	F-16
F-3	Potential Shipments of Material Analyzed for the DUF <sub>6</sub> Conversion EIS .....	F-22
F-4	Environmental Management Waste Generation Forecast for Fiscal Years 2002 through 2025 .....	F-41